

Patent claims

CLAIMS

1. A process for the preparation of (metal) salts of alkylphosphonous acids, which comprises reacting elemental yellow phosphorus with alkyl halides in the presence of carbonates, bicarbonates, amides, alkoxides, amine bases and/or solid hydroxides as bases.
2. A process as claimed in claim 1, wherein the reaction is carried out in a two-phase system comprising at least one base and an organic solvent.
3. A process as claimed in claim 1 ~~or 2~~, wherein the alkyl halides employed are methyl chloride or methyl bromide.
4. A process as claimed in ~~one or more of claims 1 to 3~~ ^{claim 1}, wherein the organic solvents employed are straight-chain or branched alkanes, alkyl-substituted aromatic solvents, water-immiscible or only partially water-miscible alcohols or ethers, alone or in combination with one another.

claim 1

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5. A process as claimed in ~~one or more of claims 1 to 4~~ wherein the organic solvent employed is toluene, alone or in combination with alcohols.

claim 1

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- 5 6. A process as claimed in ~~one or more of claims 1 to 5~~ wherein the reaction is carried out in the presence of a phase-transfer catalyst.

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7. A process as claimed in claim 6, wherein the phase-transfer catalyst is a tetraalkylphosphonium halide, triphenylalkylphosphonium halide or tetraorganylammonium halide.

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8. A process as claimed in ~~one or more of claims 1 to 7~~ wherein the temperature during the reaction is from -20 to +60°C.

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9. A process as claimed in ~~one or more of claims 1 to 8~~ wherein the temperature is from 0 to 30°C.

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10. A process as claimed in ~~one or more of claims 1 to 9~~ wherein the reaction is carried out at a pressure of from 0 to 10 bar.

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11. A process as claimed in ~~one or more of claims 1 to 10~~ wherein the yellow phosphorus is suspended or

dissolved in a solvent or solvent mixture and then reacted with an alkyl halide and at least one base.

5 *A* 12. A process as claimed in ~~one or more of claims 1 to 11~~, wherein the yellow phosphorus and the alkyl halide are reacted in a molar ratio of from 1:1 to 1:3, where the molar ratio of yellow phosphorus to base is from 1:1 to 1:5. *claim 1*

10 *A* 13. A process as claimed in ~~one or more of claims 1 to 12~~, wherein the two-phase system obtained after the reaction is separated and further processed. *claim 1*

15 *A* 14. The use of a (metal) salt of an alkylphosphonous acid prepared by a process ~~as claimed in claims 1 to 13~~ as a precursor for chemical syntheses. *claim 1*

20 *A* 15. The use of a (metal) salt of an alkylphosphonous acid prepared by a process ~~as claimed in claims 1 to 13~~ for the preparation of organophosphorus compounds. *claim 1*

25 *A* 16. The use of a (metal) salt of an alkylphosphonous acid prepared by a process ~~as claimed in claims 1 to 13~~ *claim 1*

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~~to 13~~ as a flame retardant or for the preparation of flame retardants.

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17. The use of a (metal) salt of an alkylphosphonous acid prepared by a process ^{claim 1} ~~as claimed in claims 1 to 13~~ for the preparation of flame retardants for thermoplastic polymers, such as polyethylene terephthalate, polybutylene terephthalate or polyamide.

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18. The use of a (metal) salt of an alkylphosphonous acid prepared by a process ^{claim 1} ~~as claimed in claims 1 to 13~~ for the preparation of flame retardants for thermosetting resins, such as unsaturated polyester resins, epoxy resins, polyurethanes or acrylates.